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NOTES.

PREPARATIONS FOR THE TWELFTH CENSUS.¹

THE act of March 3, 1899 under which the Twelfth Census of the United States will be taken, contains several innovations from which much is expected for the improvement of the enumeration.

Perhaps the most important of these changes is the division into two classes of the numerous inquiries which from time to time have been imposed upon the American census. Section 7 of the law provides that "the Twelfth Census shall be restricted to inquiries relating to the population, to mortality, to the products of agriculture, and of manufacturing and mechanical establishments." Reports upon these subjects must be published not later than July 1, 1902. But after the publication of these volumes, the director of the census is authorized by section 8 to collect statistics relating to special classes—the insane, feeble minded, deaf, dumb, and blind; to crime, pauperism, and benevolence; to deaths and births in registration areas; to social statistics of cities; to public indebtedness, valuation, taxation, and expenditures; to religious bodies; to electric light and power, telephone and telegraph business, transportation by water, express business and street railways; and to mines, mining, and minerals. Another year is allowed for the preparation of these reports. The primary purpose of Congress in thus dividing the work was probably to ensure a prompt publication of the results of the four main lines of inquiry. For the census office there is the important incidental advantage that, being empowered to defer the special investigations, it can pursue its major work undistracted by a multiplicity of tasks.

This restriction of the subjects of enumeration will also improve the character of the field work by simplifying the duties of the enumerators. In 1890 the enumerators who had to carry with them in making their rounds from ten to thirteen kinds of schedules complained greatly of the complexity of the work and the difficulty of understanding the necessarily elaborate instructions. This year few enumerators will

¹ Much of the material in this note is contained in a paper read before the meeting of the American Economic Association at Ithaca, December 29, 1899, by Professor WALTER F. WILLCOX.

have to carry more than four or five schedules. The population schedule and the brief supplementary schedule relating to persons defective in sight, hearing, or speech must be carried by every enumerator. But the alternative population schedule for reporting Indians will be needed by few except enumerators in Indian Territory and Indian reservations. Moreover as few farms—even in the highly technical sense in which that word is used by the census office¹—are found in cities, urban enumerators will require few or no agricultural schedules. On the contrary many horses, cows, etc., are kept by persons living in towns and cities and the simple form for reporting their number will be much used in urban districts. In most cities the task of collecting statistics relating to manufacturers requires so much technical skill that it has been entrusted to specially qualified agents. Where this is the case the enumerator will be relieved entirely of the manufacturing schedules. Similarly the reports upon penal institutions have for the most part been put into the hands of some of the officials connected with the institutions. Finally, in those parts of the United States where deaths are registered by state or municipal authorities, the mortality statistics will be taken directly from the records, instead of depending upon the uncertain method of enumeration. Perhaps one third of the population live in such “registration areas.” As his work will thus be less complex than in 1890 it seems reasonable to expect of the enumerator a clearer understanding and more accurate performance of his duties.

While the enumerator's work is thus simplified, his compensation is increased so as to make the appointments attractive to a higher grade of men than were secured in 1890. At the rates of pay then allowed if many men found after undertaking the enumeration of a district that they were unable to earn their customary wages and suspicion arose that some enumerators finding their tasks unprofitable slighted the work in order to finish as soon as possible. This may have led in certain districts to considerable omissions. To prevent a recurrence of this difficulty Congress changed the regulations concerning the compensation of enumerators. While the maximum and minimum rates to be paid are the same as allowed by the act of 1889—2 to 3 cents for every name and 2 to 5 cents for every death reported, 15 to 20 cents

¹“For census purposes, market, truck, and fruit gardens, orchards, nurseries, cranberry marshes, greenhouses, and city dairies are ‘farms’ *provided* the entire time of *at least* one individual is devoted to their care.” *Instructions to Enumerators*, paragraph 272.

for filling out a farm schedule, and 20 to 30 cents for every factory visited—the language of the section has been so modified as to allow the higher rates to be more generally paid. The rates to be given in every district have been fixed after a most careful examination of the time spent and sums earned by the enumerator in 1890. Of course the rates vary as local conditions facilitate or hinder enumeration, but the object has been so to adjust them that a person of average industry and ability may earn three dollars per day of ten hours. It is hoped, consequently, that there will be little disposition to slight the work as unremunerative.

As a further step towards improving the field work the census office has devised a method of testing the fitness of every applicant for appointment as an enumerator. This has been done by means of a "test schedule." Applicants have been sent a printed narrative of facts concerning a number of families such as they might receive in answer to questions asked at the houses in their districts; from the information contained in this narrative they have been required to fill out a blank schedule in accordance with the directions contained in the pamphlet of "Instructions to Enumerators." These schedules were sent to the supervisor of the district and, after the errors were marked, forwarded to Washington. This has given the census office a specimen of the penmanship and mastery of the instructions of every applicant for appointment, and has enabled it to prevent the selection of incompetent candidates.

One other plan for improving the enumeration deserves mention. In taking a census European countries generally count every man in the place where he happens to be at midnight of the day to which the census refers. Under this plan there can be no doubt as to whether any person whom the enumerator finds in his district is to be counted or not, and conversely the enumerator has no concern with any person not in his district at the time the rounds are made. But, in the United States, where the primary purpose of the census as provided for by the Constitution is to furnish a basis for the territorial distribution of Representatives in Congress, every person is counted at his "usual place of abode" whether he happens to be there on June 1 or not. The political reason for this rule is obvious, but, unfortunately, it places many difficulties in the way of an accurate enumeration. The particular danger is that families not in their "usual place of abode" when the enumerator makes his rounds will be omitted. When the

enumerator finds a dwelling vacant, and no one in the neighborhood can answer the census questions regarding the members of the family living there, he must perforce omit them. Nor will the family be reported by any other enumerator, for the man in whose district they happen to be is allowed to count only the habitual residents. Omissions arise in this manner with especial frequency in large cities where many families leave town early and shut up their houses for the summer. In perhaps a score of the cities, where this difficulty is most serious, it will be met by requiring enumerators to keep in a "street book" a record of every house visited. Whenever a vacant dwelling is found any information obtainable as to the name and probable whereabouts of the inmates will be entered. These records will be put in the hands of special agents who will endeavor by correspondence or otherwise to communicate with the members of the family and get from them answers to the census questions. This information will then be entered on the schedules of the proper district. In New York the office has also sent through the mails many thousand cards asking that persons intending to be absent in June state where they may be found. Elsewhere the co-operation of the newspapers will be utilized for a similar purpose, everyone being urged to leave written answers to the questions in case he is likely to be away from his "usual place of abode" at the time of the enumeration.

The accuracy of the census depends primarily upon the faithfulness with which the field work is performed. If the material received by the census office for tabulation is defective, no diligence upon its part can supply the omissions or correct the errors. But excellent material may result in a poor census report if the compilation is unintelligent and the analysis of the tables hasty. A well-trained office force is, therefore, second only in importance to a conscientious enumeration. Much attention has been given to the organization of the central office in Washington, and there seems quite as much reason to anticipate improvement in the compilation and interpretation of the tables as in the character of the field work.

Here, also, the improvements are due in part to Congress and in part to the census administration. To insure more efficient supervision the staff was reorganized by providing for six new officials—an assistant director, who must be "an experienced practical statistician," and five chief statisticians. The salaries attaching to these positions are

four and three thousand dollars. In 1890, the men who had practical direction of the statistical work were the "chiefs of division," at two thousand dollars. Not only does the provision of higher salaries make it easier to obtain men of the requisite qualifications, but the new officials will be less burdened by the minutiae of administration; for the chiefs of staff still remain as the executive officers of the chief statisticians, leaving the latter more leisure for the general direction of the work.

The assistant director, Dr. Frederick H. Wines, who has been connected with the Tenth and Eleventh Censuses, has general charge of the statistical work. The existence of such an office opens the way to a closer co-ordination of the different undertakings of the census than has heretofore been possible. The chief statisticians each preside over a division. The first four have in charge the collection, tabulation, and analysis of the statistics relating to the four main lines of inquiry — population, mortality, agriculture, and manufactures. The fifth division is one of the innovations of the Twelfth Census. It is called the "Division of Methods and Results," and its function is to "study, analyze, and interpret the past experience of the United States, the several states, and foreign countries as expressed mainly in their census volumes," and to "prepare criticisms and summaries stating the results of such experience, and, in the light of it, what is to be looked for as significant in the tables of the Twelfth Census."¹ Professor Walter F. Willcox, of Cornell University, is the chief statistician, and connected with the clerical staff are economic students from the Massachusetts Institute of Technology, Harvard, Columbia, Johns Hopkins, Wisconsin, Chicago, and Stanford.

In the organization of its clerical force the Census Office necessarily labors under great difficulties. It requires for a short time the services of from two thousand to twenty-five hundred clerks. The work they have to perform is peculiar and requires intelligence as well as some training. Not being under the civil-service law, there is some danger that inefficient persons will obtain appointments. As a mode of protection the director was authorized by Congress to examine all applicants for clerical positions. This authorization has been taken advantage of by the appointment of an examiner and the rigid insistence on the rule that no person shall be accepted as a clerk who is unable to pass the prescribed tests. Of course, the examinations have been of a practical nature, the chief purpose being to make certain that all clerks could

¹ WALTER F. WILLCOX, *op. cit.*, p. 17.

write legibly, spell in orthodox fashion, and perform accurately simple arithmetical operations. But even so a very high percentage of applicants is said to have failed of making the requisite averages for passing.

Another change that will materially aid the work of the office is the provision of a building where practically the whole force can be brought under one roof. In 1890 the work of supervision was seriously hampered by the fact that different parts of the work were being carried on in several different buildings, some of them a considerable distance apart. To overcome this difficulty the office, though not authorized to spend any of its appropriation in the construction of a building, succeeded in inducing private capitalists to erect a building for them substantially in accordance with the plans of the assistant director. The characteristic feature of the new building is the two great halls covering over an acre of floor space where the very large force of tabulating clerks can be brought together under a single management.

As in the Eleventh Census, the actual work of tabulation will be performed by the aid of the Hollerith electrical system. This decision was reached after a thorough test of the most prominent rival systems. Its use requires that the information upon the schedules concerning each person reported be transferred to a card about six inches long and three inches wide. This is done by punching holes in the card, the position of every hole standing for some fact—as that the person lives in Chicago, is a male, white, unmarried, twenty-one years of age, father born in Ireland, mother in Massachusetts, able to read and write, a painter by trade, etc. The electrical machines to which the punch cards pass are provided with plates of blunt steel pegs supported by springs. There is a peg for every possible hole. Where a hole has been punched the needle passes through, enters a cup of mercury below, and establishes an electrical current which moves the counter on a connected dial. The readings of these dials after a set of cards has been run through show how many males, females, white persons, colored persons, etc., live in the district to which the cards refer.¹ The use of electricity for the tabulation of census data was perhaps the chief advance made by the Eleventh Census. Since then the Hollerith system has been successfully employed in Austrian and French censuses,

¹The best description of the Hollerith tabulating system and its use in census work is found in DR. H. RAUCHBERG'S article, "Die elektrische Zahlmaschine und ihrer Anwendung insbesondere bei der österreichischen Volkszählung," in the *Allgemeines statistisches Archiv*, vol. ii. pp. 78-126. The inventor has described his system in the *Journal of the Royal Statistical Society*, vol. lvii. pp. 678 ff.

and it is at present being used for the censuses of Cuba and Porto Rico taken under the supervision of the War Department.

The shortness of the time allowed for the completion of the reports will probably make it impractical to introduce any very extensive modifications in the method of presentation. Enumeration commences June 1, 1900, and the four volumes dealing with population, mortality, agriculture, and manufactures must, according to the terms of the law, be published by July 1, 1902. Persons having a practical acquaintance with the work of converting the raw material supplied by schedules into finished tables accompanied with explanatory text will appreciate how short a time two years is for the accomplishment of such a task; others may recollect how much more time was consumed by the Eleventh Census in doing the same work. Under the circumstances every effort must be bent to expediting the publication of the four volumes as the law directs. However when this has been accomplished the Census Office may be able to undertake some further analysis of the material in its keeping. How much can be done in this way is of course undetermined as yet; but as one example of the kind of work which the Census Office desires to do may be mentioned the plan to tabulate the data regarding population with the family, instead of the individual, as the unit. Another possibility is the preparation of a special study of age returns with an attempt at their correction. That such work would add greatly to the scientific value of the census, and that to at a comparatively small extra cost, is clear. But for it the public must wait until the regular reports are finished.

WESLEY C. MITCHELL.

TRUSTS, THE MARGINAL PRODUCER AND PRICES.

RICARDO is responsible for many theories, orthodox and otherwise, in the realm of Economics. The Socialists drew from his writings the fundamentals of their doctrine of value and the "iron law of wages." Now comes a knight of concentration and declares that the modern combination is helpless to raise prices.¹ The argument for this last statement is Ricardian as will be recognized when developed in the next few sentences. It is as follows: so long as a combination cannot furnish the supply of commodities to meet the demand, the remaining

¹ GEORGE GUNTON in a lecture in New York City, March 3, 1900.